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Community Identity and Collective Efficacy:
A Social Cure for Traumatic Stress in post Earthquake Nepal

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Abstract

Post-Traumatic Stress Disorder (PTSD) was initially conceptualized as a psychopathology that arose as a consequence of war time experiences. More recently, available evidence has demonstrated that post-traumatic stress (PTS) as a consequence of war is buffered by social identity processes. In such contexts, identity resources are arguably more readily accessible given the integral relationship between social identities and intergroup violence. There is no evidence as yet to suggest that social identity processes may act to reduce PTS responses to naturally occurring disasters such as earthquakes and even less data pertaining to non-Western contexts where the impact of such disasters tend to be particularly catastrophic. This paper reports on a study undertaken in earthquake-affected regions in Nepal devastated by April 2015 quake and its major aftershock a month later. Participants (n=399) completed measures of their earthquake experience, Post-Traumatic Stress and Post Traumatic growth (PTG), as well as measures of community identification and collective efficacy. In total 399 people completed the measures approximately six months after the quakes. Results of the study indicated that consistent with tenets of the social identity framework, ethnic and gender group memberships impacted on reported experiences during the earthquake. Reported experience during the quakes and ethnic group membership were both related to increased symptoms of PTS. Ethnicity was also linked to the proportion of respondents reporting clinical levels of PTSD symptoms. The relationship between earthquake experience and PTG was mediated by community identification and collective efficacy. Earthquake experience also had an indirect effect on PTS through collective efficacy. Implications of these findings for those working with traumatized groups are discussed.

Community Identity and Collective Efficacy: A Social Cure for Traumatic Stress in post-Earthquake Nepal

A growing body of research shows that social relationships and social identities have a profound impact on mental and physical health (Cruwys, Haslam, Dingle, Haslam, Jetten, 2014; Gallagher, Meaney & Muldoon, 2015; Jetten, Haslam & Haslam, 2012). As this body of research has grown this has demonstrated both the health enhancing (Gleibs, Haslam, Haslam & Jones, 2011; Johnstone, Jetten, Dingle, Parsall & Walter, 2016) as well as the health damaging consequences of social identities (Howell et al., 2014; McNamara, Stevenson & Muldoon, 2013). In short, the implications of social identity for health are complex. The present paper in attending to potential positive and negative consequences of trauma explores both post-traumatic stress and post traumatic growth in those exposed to substantial trauma as a consequence of devastating earthquake in Nepal in April 2015 and its aftershocks. Further, and in line with the concept of identity as a social cure (Jetten, Haslam & Haslam, 2012), we consider the role social identity processes (namely community identity and collective efficacy) play in mediating adjustment to this traumatic stress.

Post-Traumatic Stress, Gender and Ethnic Group Membership

Muldoon & Lowe (2012) in a synthesis of the literature emphasising the role of identity processes in understanding post-traumatic stress, highlight how identities could be seen as both a benefit and a burden in terms of the risk, progression and maintenance of post-traumatic stress. Despite controversies over its definition and measurement as a unique disorder, distressing and severe responses to extreme and traumatic events are evident across time (Saigh & Bremner, 1999). Post-traumatic stress disorder (PTSD) was officially categorized as a disorder in the 1980 edition of the DSM (Bisson, Cosgrove, Lewis &

Roberts, 2015). At an individual level, extreme traumatic experiences evidence extreme distress. Symptoms indicative of PTS include emotional numbing, anxiety, hyperarousal and intrusive thoughts (Bisson et al., 2015). Alongside negative traumatic responses, positive changes following trauma have long been recognised in philosophy and religion (Linley & Joseph, 2004; Tedeschi & Calhoun, 1995; Tedeschi et al., 1998) as well as the psychological literature (Park et al, 1996). More recently, post traumatic growth (PTG) or positive psychological changes have been reported after a range of life challenges, including cancer (Stanton et al., 2006; Collins et al., 1990), HIV diagnoses (Bower et al., 1998), bereavement (Davis et al., 1998), rape (Burt & Katz, 1987; Thompson, 2000), war and conflict (Elder & Clipp, 1989; Waysman et al., 2001), and illness and surgery (Affleck et al., 1987; Tennen et al., 1992). Longitudinal studies indicate that whilst post-traumatic stress is a necessary prerequisite for growth, these are independent constructs that can and do coexist (Dekel, Ein-Dor, & Solomon, 2012).

Centrally from a social identity perspective, traumatic experiences are bound up indelibly with group memberships (Muldoon, 2013). Empirical studies that examine the occurrence of trauma within populations demonstrate that stressful experiences are not randomly determined. Experience during war-times are shaped by social group memberships such as racial, religious, gender and socio-economic groupings (De Jong et al, 2001; Dyb et al, 2014; Hatch & Dohrenwend, 2007; Muldoon, 2013). For example, in Northern Ireland, experiences of political violence during the Troubles were not (and continue not to be) evenly distributed across the population (Hayes & McAllister, 2001); those from deprived backgrounds generally report greater experience of violence than their middle class counterparts, and minority group members (Catholics) more than those from the majority group (Protestants) (for comparable analysis in South Africa see Kaminer & Grimsrud, 2008). Whilst incidence of traumatic experiences as a consequence of political violence are

readily accepted as being linked to group memberships, this is something that we may not be as willing to accept in non-conflict situations. Dominant western ideology is permeated by notions of equity and fairness. However, the life-time instance of rape is disproportionately higher amongst women than men and poor women are far more likely to be raped than women from more affluent nations, or more affluent regions within nations (Kubiak, 2005). Similarly, the incidence of road traffic accidents is disproportionately higher amongst young men than either women or older men. More fine grained analysis indicates serious road traffic accidents are higher amongst men who are not married (Licaj, Haddak, Pochet, & Chiron 2011). And social identity processes are implicated in the explanation of these patterns. Road traffic accidents and risky choices around alcohol and drug use as well as risky norms around driving are more prevalent in young men (Elliott, Shope, Raghunathan & Waller, 2006) and these normative behaviours linked to both poverty and gender are causally linked to incidence and severity of road traffic accidents (Huurre, et al., 2010) .

This evidence then speaks not only to a role for groups in determining the incidence of stressors encountered but also to the qualitative distinctions in the nature of stressors encountered by women and men, the rich and the poor, the weak and the powerful. In Nepal social division and exclusion associated with gender and ethnicity (based on the caste system) remains problematic (ADB, 2010). Although caste-based discrimination was made illegal in 1964, and the re-establishment of multiparty democracy in 1990 described Nepal as a multi-ethnic, multi-lingual, democratic state in which all citizens were equal, the legal and sociocultural norms that pertain mean that women and socially excluded low caste and ethnic groups experience discrimination, disempowerment and inequality. Gender disparities are highest in the lowest caste and ethnic groups with for example trafficking and servitude of low caste women and girls a pressing social concern (UNODC, 2009)). So given disparities in housing, health and economic resources associated with both gender and ethnicity, we

would expect that these would impact in very meaningful ways in terms of experiences and adjustment subsequent to the catastrophic impact of the 2015 earthquakes.

For those affected by the earthquake in Nepal both gender and ethnicity are important dimensions of culture that are likely to impact on lived experience after the earthquakes. Davis, Davis and Gibson (2015) highlight the collective or group level component of trauma and the need for research to consider the scale of the trauma together with its cultural context to fully understand the nature of post-traumatic sequelae. For example women and low caste ethnic groups are much more likely to be illiterate (ADB, 2010) and therefore less able to access available health messaging in the wake of the quake. Similarly these groups were most likely to have housing most at risk of collapse and are therefore most likely to be bereaved, injured or made homeless by the earthquake radically altering their life circumstances (Khanal, 2015). And women traditionally occupy less powerful roles and hold the lion's share of caring responsibilities in Nepali society (ABD, 2010), reducing their ability to work and earn in the aftermath of the earthquake. In short socially excluded groups have depleted social, economic and psychological resources by virtue of their social position which present additional challenges during times of trauma where available resources are stretched.

Collective Efficacy, Community Identity and the Nature of the Trauma

This collective dimension of trauma is often side-lined despite it being central to traumatic experiences (Kohrt & Hruschka, 2010; Marsella, 2010). In societies like Nepal struggling with basic infrastructure and severe poverty, the economic and social impact of trauma such as earthquakes are often chronic and enduring. This is unlike the predominant acute conceptualisation of trauma associated with PTSD in the West. In Nepal there is no term that describes post-traumatic stress in the Nepali language or other languages spoken in Nepal (Kohrt and Hruschka, 2010). One idiom of distress widely used is *Dukkha* (suffering,

trouble, hardship). *Dukkha* is considered to be an inevitable and constant aspect of everyday life. As Hepburn (2017) notes, the word *dukkha* is far more commonplace than its counterpart *sukkha* (happiness, or more realistically, contentment with the lack of obvious, intrusive suffering). In this way, in Nepal this form of distress is not only socially acceptable but also a fundamental feature of human life. *Dukkha* is a normal part of everyday life.

On the other hand, non-Western contexts may provide higher levels of identity resources. Cultures with higher levels of collectivism (which is associated for example with more co-operative behaviour) may facilitate higher levels of social support (Allik, & Realo, 2004). Equally trauma, marginalisation and threat can increase identification. Not only does misery love company but company can militate against misery, so to speak. This process has been articulated most completely, relative to discrimination, in the rejection identification model (Schmitt, Branscombe, Postmes & Garcia, 2014) and more recently, relative to war trauma, in the threat identification hypothesis (Schmid & Muldoon, 2015). Effectively the experience of adversity, and in particular collective adversity, increases group identification. So though adversity may impact well-being, the increased identification with the group as a consequence of the collective experience, can act to ameliorate some of the negative consequences of the adversity. Assumed in this understanding of adversity and trauma is the importance of subjective appraisal of the event which is consistent with the position that the development of PTS results not only from the trauma, but from the interpretation of that experience.

Interpretations of trauma can be driven by social identity processes. This includes our sense of available secondary resources such as collective efficacy. This sense that one belongs to a group whose actions have delivered generally positive outcomes previously (Antonovsky, 1979; Benight, 2004) has been presented as central to the successful intervention to support those affected by mass trauma. The specific sense that a group can

cope with adversity appears to be most beneficial (Benight & Harper, 2002) with collective efficacy being shown in one study to improve psychological outcomes in first responders exposed to traumatic stress (Benight, 2004). Groups can share a sense of their ability to cope when they encounter mass trauma, so though the shared trauma increases the risk of PTS, by the same token collective efficacy will also be enhanced. High levels of efficacy in the face of uncontrollable stressors (such as an earthquake) can also undermine adjustment (Antonovsky, 1979), particularly where the groups response is below par. Despite the plausible theoretical connection and the fact that collective efficacy is believed to be central to the successful intervention to support those affected by mass trauma, there are very few empirical studies to support this position (Hobfall et al., 2007).

Similarly a sense of social connectedness is believed to be central to successful support of those affected by mass trauma (Hobfall et al., 2007). A large body of research exists on the central importance of social support and sustained attachments to loved ones in combating stress and trauma (Norris, Friedman, & Watson, 2002; Kellezi & Reicher, 2012). Social connectedness increases opportunities for knowledge essential to disaster response (e.g., ‘Where is medical care available?’ ‘Is there any shelter locally?’). Where fatalities are high and literacy and infrastructural support levels low, social groups and more particularly communities are likely to be increasingly important vehicles for available social support. Available PTS studies support this position: identification with one’s own community is associated with lower PTS symptoms and better adjustment in those affected by politically motivated violence in Northern Ireland (Muldoon & Downes, 2007), Israel (Canetti, Halperin, Sharvit & Hobfoll, 2009) and Kosovo (Kellezi & Reicher, 2012). Evidence for the value of community identification as a resource for coping with mass trauma in peace time contexts is not however apparent in the literature.

So far we have argued that groups and social identities are implicated in the risk for and expression of PTS. A final point in support of this position is that post-traumatic stress reactions appear to be determined, in part at least, by the nature of the trauma experience. Galea, Nandi and Vlahov (2005) in their comprehensive review of the literature document evidence that PTS tends to be lower after natural disasters (e.g floods, earthquakes) rather than after human-made/technological disasters (e.g nuclear incident, airplane crashes). Similarly traumatic events that arise from intentional human action (such as war) tend to demonstrate higher prevalence rates than those that are viewed as natural (such as earthquakes) (Santiago et al., 2013). Within the field of clinical psychology, PTSD is constructed as an externalising condition, in this way it can be seen as an acting out of the anger associated with a traumatic experience. Where this experience can be seen to result from the intentional malevolence (war or violence), negligence or incompetence (human disasters) our relationships and trust in others is likely to be more challenged than in naturally occurring situations of mass trauma. In this way these different rates of PTSD may reflect identity related processes such as trust and belonging impacting on the experience of trauma. Indeed in communities responding to natural disasters such as earthquakes, the possibility that identity acts to suppress PTS and supports PTG is likely to be highest.

The present study then adds to the recent call for researchers to move the focus from the isolating consequences of trauma to highlight the way in which traumatic events can be instrumental in consolidating community identities (Hutchinson, 2010; Muldoon & Lowe, 2012; Drury et al., 2009). Consistent with this view is the prevalence estimates for post traumatic growth among people who have experienced psychological trauma which tend to range from 30% to 80% (Linley & Joseph, 2004). Whilst there has been confusion regarding the differences between PTG and qualities such as resilience, optimism, hardiness (terms which refer to a person who has adjusted successfully despite adversity; O'Leary, Alday &

Ickovics, 1998), PTG differs from these constructs as it relates to outcomes of adjustment in a manner *beyond* those demonstrated by resilience, optimism, and hardiness. Three broad areas of positive outcomes have been identified in the PTG literature. First, people report changing self-views, including an appreciation of their own personal strength as well as a greater awareness of new possibilities in their lives. Second, individuals report changes in their philosophy about life including changed views about their priorities. And finally greater compassion for others who have suffered and increased levels of empathy are reported. Given the literature highlighting trauma as a basis for emerging shared identities (Drury et al., 2009; Muldoon & Lowe, 2012, Muldoon, 2013) and the fact that the PTG construct is embedded in altered views of both the self and others, we suggest that social identity processes may be a central driver of this growth.

The Current Study

The present paper presents a cross-sectional study of Nepali respondents who survived the devastation of earthquake in April 2015 and its aftershocks. Survey respondents were sampled six months after the quakes in villages close to the centre of the quake, in urban areas where there was significant loss of life and where many were resident in shelters established to provide alternate housing for those left homeless by the quake. Respondents completed measures of earthquake experience, post-traumatic stress symptoms and post traumatic growth, community identification and collective efficacy. Our first hypothesis was that ethnic and gender group membership is linked to experience of trauma and post traumatic sequelae. Taking a social identity approach, we hypothesised that less powerful ethnic and gender groups would report more traumatic experiences and higher levels of PTS (H₁). Our second hypothesis was that there would be a direct positive relationship between

earthquake experience and PTS and PTG (H₂). Further, we hypothesised that community identification would be positively related to earthquake experience. Given the limited evidence on the role of community identification in negotiating trauma, we hypothesised it would act to mediate the impact of earthquake experiences on post-traumatic stress symptoms (H₃) and post traumatic growth (H₄), but not the direction of this mediation. Similarly we hypothesised a role for collective efficacy but given the contradictory evidence, we did not predict the direction of this mediating effect. In line with Benight and Harper (2002) and because the Nepali people can be considered to have dealt with wide scale trauma in the past (Tol et al., 2010), we specifically examined collective efficacy using a national frame of reference. Therefore we hypothesised that national collective efficacy would mediate the relationship between earthquake experience and PTS (H₅) and PTG (H₆).

Method

Participants

399 participants took part in the study from eight districts, namely Gorkha, Dhading, Nuwakot, Kathmandu, Lalitpur, Bhaktapur, Kavrepalanchowk and Sindhupalchowk. These were among the fourteen districts declared as the most affected areas by the Government of Nepal. Of the 399 respondents, 52% (n=209) self-assigned as male, 45% (n=181) as female and one person indicated they were third gender (a category recognized in the 2011 national census in Nepal) and eight people did not report their gender. The mean age of the sample was 35 years (range 16 to 84). Reflecting the poverty in Nepal, the mean per person income for the sample was 41805 Nepali rupees (SD=38854) equivalent to €347 per year.

In terms of ethnicity, 14% (n=55) people reported they were Chhetris, 27% (n=109) categorised themselves Brahmins, 30% (n=121) self-categorised as Janajatis, 5% (n=19) as Dalits, and 18% (n=71) as 'other'. These categories were based on the major divisions made

in the Central Bureau of Statistics (CBS) data which records 126 different caste/ethnic groups. The number of cultural groups in Nepal is debated. CBS 2011 has recognized 63 groups in the Janajati ethnic group category alone which refers collectively to approximately 50 minority groups living primarily in the hills and mountains, and 13 groups living in the Terai. Dalit, a term used to refer to the formally untouchable castes, includes more than 25 groups living in the hills and in the Terai (GoN, 2014). Many Janajati activists view themselves as marginalized and internally colonized nationalities, and blame the higher castes (Brahmin and Chhetri) for their condition. Dalits, on the other hand, consider themselves as religiously, culturally, economically and socially oppressed groups as a result of their assignment in the national legal code of 1854 to the lowest position in the caste hierarchy. Those who indicated 'other' as their ethnic identity category mentioned mixed groups of which the largest group in our sample was Muslim, followed by Majhi (people who live by fishing). Though discrimination against the Muslim community and lower caste groups has lessened, the Muslim community and the lower status caste groups represented in the other categorisation have remained marginalized politically, socially and economically (ABD, 2010). Table 1 indicates the composition of the sample together by gender and ethnicity.

Measures

Earthquake experience: Predictor Variable

A five item measure developed by Nolen-Hoeksema and Jannay Morrow (1991) was used to measure the extent of earthquake experience. Respondents were asked to indicate on a scale ranging from 1 (*none*) to 5 (*a great deal*): 1) how much damage was caused to the area they were in when the earthquake happened; 2) the damage caused to their residence; 3) whether they were injured as a result of the earthquake; 4) whether a family member or close friend was injured; 5) whether a family member or close friend was amongst the fatalities. In line

with its previous use, a total score was calculated that therefore reflects the severity and number of traumatic experience as a consequence of the earthquake. The alpha coefficient for the scale on this occasion was .70.

PTSD Checklist (PCL): Criterion Variable I

The specific stress version of the Post- Traumatic Stress Disorder Checklist (PCL), a 17- item self-report instrument based entirely on DSM–IV criteria (American Psychiatric Association, 1994) for PTSD was employed. The instrument has been used for screening in previous surveys (Muldoon & Downes, 2007; Schlenger et al, 2002) and is well regarded with impressive reliability and validity (Blanchard et al, 1996; Walker et al, 2002). In the first instance respondents were asked whether they had encountered a distressing event as a result of the earthquakes. Those who reported a particularly distressing event then completed the 17-item PCL indicating how much they were bothered as a result of their experience of the Earthquake by PTS symptoms in the last month. Sample items included ‘*Difficulty sleeping*’ which was rated from 1 (not at all bothered) to 5 (extremely bothered). Responses to all 17 items created a total summed score. The alpha coefficient for the scale was .91.

Post traumatic growth (PTG): Criterion Variable II

Post traumatic growth was measured using 14 items from the Perceived Benefit Scale (McMillen & Fisher, 1998). This self-report questionnaire asked participants to rate the extent to which they experienced on a scale of 1 (not like their experience) to 5 (very much like their experience) positive changes as a result of the earthquake. A sample item is ‘*As a result of the earthquake, I am more sensitive to the needs of others.*’ A total PTG score was created from scores across four domains using family closeness, faith in people, compassion, and spirituality subscales. The alpha coefficient for the scale was .82.

Collective Efficacy: Mediator Variable I

Five items were used to measure participants' sense of collective efficacy adapted from Reicher & Haslam (2006). Respondents were presented with the series of statements (e.g. '*Nepali people can find solutions to their problems*') and asked to respond on a scale of 1 to 7 the extent to which they agreed (7) or disagreed (1). Responses were totalled and a mean score generated to represent respondents' overall sense collective efficacy. The alpha coefficient for the scale was .79.

Community Identification: Mediator Variable II

Community Identification was measured using four items that tapped into respondents' sense of identity, commitment and importance which has been used previously to measure identification local community membership (McNamara, Stevenson & Muldoon, 2013). Respondents indicated the extent of their agreement with a series of statements using a scale from 1 to 7. A sample item included '*How strongly do you identify with your local community?*' Mean scores across the four items created a total score with higher scores indicating higher levels of community identity. The alpha coefficient for the scale was .86.

Procedure

In the first instance the English versions of each of the measures to be employed for the study were compiled and agreed between authors. The second and fifth authors then reviewed all items and considered their appropriateness to the Nepali context. Next the second author translated all items. This translation was then reviewed by the fourth author to ensure that the substantive meanings of the items had not been changed. At this stage the questionnaire was back translated by the fourth author. Items where the meaning was seen to have been compromised were the subject of further discussion and clarification until agreement was reached that the intended meaning of the item had been retained in the translation.

Data was collected over a one week period approximately six months after the earthquake and its major aftershock in Nepal. The first and second authors worked with a group of twenty graduate and final year university students who were trained in the administration of the survey. The second author worked with gatekeepers such as local village district committees, community leaders and those managing accommodation for those who had lost their homes as a result of the earthquakes to facilitate the completion of the surveys in these field work locations. The trained students then travelled in pairs to areas that had been directly affected by the earthquake, making contact with interested participants through the gatekeepers. The first and second authors routinely accompanied students undertaking data collection efforts. Questionnaires were either self-completed in paper or pen format (40%) or where literacy was a problem by reading the items to the respondent (60% of the sample).

Ethical considerations

All gatekeepers received a full explanation of the study as did respondents prior to completing the questionnaire. This was provided in writing and also given low levels of literacy, was explained to participants when invited to participate. The confidentiality and anonymity of all responses was assured; participants were also given the opportunity to refuse to participate and/or to withdraw at any time. Where respondents appeared to be particularly distressed, follow up support was made available. This occurred in two cases and the participants were subsequently contacted by the project team, in both cases participating in a longer interview and contact between the participant and support service in the NGO sector was established.

Results

Overview of Analysis

For the purposes of the study, gender and caste/ethnic groups were treated as measured independent variables. A central tenet of the social identity framework is that the group matters in terms of our lived experiences with consequent impact on social identities and appraisal of stress (Gallagher, Meaney & Muldoon, 2015; Muldoon, 2013). For this reason and to address hypothesis 1 we used 5 MANOVAs, to examine gender and ethnic group differences in 1) earthquake experience, 2) collective efficacy 3) community identification and 4) post-traumatic stress and 5) post traumatic growth. To explore hypothesis 2 and to understand the relationship between earthquake experience and post-traumatic stress on the one hand, and post traumatic growth on the other, we examined the relationships between all variables using simple correlations. Then using the PROCESS mediation tool we examined our four final hypotheses. We examined separately in four mediation models whether community identification or collective efficacy intervened in the relationship between earthquake experience and post-traumatic stress and growth. In these models we controlled for caste/ethnic group membership as a potential covariate given it was related to experience of trauma (see below).

Gender and Caste/Ethnic Group differences

Gender was observed to have a significant main effect on the extent of personal injury and loss experiences reported during the earthquake ($F=(2, 355)4.23, p=.05, \eta_p^2=.01$) with women ($M=2.79, SD=.9$) reporting significantly more injury and loss than men ($M=2.6, SD=.83$) though this was not a strong effect. No gender differences measures of PTS, PTG or social identity measures were observed.

Ethnic group membership also had a significant main effect on the extent of personal injury and loss experiences reported during the earthquake ($F=(4, 356)3.98, p=.004, \eta_p^2=.04$;

see table 1) as well as reported symptoms of post-traumatic stress ($F=(4,356) 3.17, p=.01, \eta_p^2=.03$) (see table 1). Consistent with the social identity position, the highest levels of personal injury and loss were reported in the lower ethnic groups, namely Dalit and Janajati and the socially marginalised 'other' group (see table 1). For example the Janajati group reported significantly more negative experiences as a consequence of the quake ($M= 2.89$) compared to the high caste Chhetri group ($M=2.34$). Using the highly sensitive and specific cut-off score of 30 to identify people with the disorder (Blanchard et al, 1996), the prevalence of PTSD cases was comparatively high. PTSD 'caseness' was also observed to be significantly related to ethnicity ($\chi^2= (1, 4) 10.35, p=.04$). Those in lower status caste and ethnic groups reported having more severe symptoms such that a diagnosis of PTSD was warranted in greater proportions within these groups (57.5% of all Dalit respondents were 'cases', 59.5% of all Janajati and 66.5% of the other category: see table 1) than in the high caste Chhetri (47.3% & of all were cases) and Brahmin (45%) groups. No (gender x ethnicity) interactions were observed in relation to any of the measured variables.

Collective Efficacy as a Mediator of Post Traumatic Sequelae

Simple mediation models using PROCESS model 4, which uses ordinary least squared regressions to yield unstandardized path coefficients for all pathways and total, direct and indirect effects were tested (Hayes, 2013). Effects are deemed significant when the lower to upper limits of the accelerated 95% confidence intervals (CI) do not pass through zero. The current analysis was undertaken both with and without bootstrapping. Bootstrapping drew 1000 random samples from the data pool to estimate each pathway effects, with computed bias corrected and accelerated 95% CIs determining the significance of each pathway. Bootstrapping made no assumptions about the normality in the sampling distribution and therefore had superior control over type 1 errors when compared to non-bootstrapping

Two simple mediation analyses, including ethnicity as a covariate, were performed to analyse separately whether collective efficacy influenced the association between earthquake experience and post-traumatic stress and post-traumatic growth (Figure 1). As hypothesised, earthquake experience predicted greater collective efficacy, $\beta = .35, p = .001$, and higher rates of post-traumatic stress symptoms, $\beta = 9.89, p = .001$. An indirect effect of collective efficacy on the PTS (see table 3) earthquake experiences relationship was apparent (Indirect effects, $\beta = .39, 95\%CL [.05, .90]$). Those reporting higher collective efficacy also reported higher PTS symptoms. Ethnic group membership was a significant covariate in this model, $\beta = 1.61, p = .004$.

Earthquake experience was also related to higher post traumatic growth, $\beta = .15, p = .001$, and, as previously, greater collective efficacy, $\beta = .35, p = .001$. There was a significant indirect effect of collective efficacy on PTG earthquake experience relationship. Increased collective efficacy associated with increased earthquake experiences was linked to greater post-traumatic growth (Indirect effects, $\beta = .05; 95\% CL [.03, .08]$). Ethnic group membership was not a significant covariate in this model explaining PTG, $\beta = .04, p = .12$. In these models earthquake experience and collective efficacy explained 34% and 16% of the variance in post-traumatic stress symptoms and post traumatic growth respectively.

Community Identification as a Mediator of Post Traumatic Sequelae

A further two simple mediation analyses, again including ethnic groups as a covariate, were performed to analyse separately whether community identification mediated the relationship between earthquake experience and post-traumatic stress and post-traumatic growth (Figure 2). Obviously earthquake experience was again related to post traumatic stress, $\beta = .28, p = .001$ and post traumatic growth, $\beta = .29, p = .001$. And earthquake experience predicted higher community identification, $\beta = .28, p = .001$. There was a

significant indirect effect of community identification on PTG, with higher community identification being associated with greater PTG (Indirect effects, $\beta = .07$, 95%CL [.04, .11]). Ethnic group membership was a significant covariate in this model, $\beta = .05$, $p = .04$. There were however no significant indirect effect of community identification on PTS (Indirect effects, $\beta = -.05$, 95%CL [-.38, .28]) and the relationship between community identification and PTS was not significant, $\beta = -.18$, $p = .78$ (see table 3). Ethnic group membership was a significant covariate in the direct effect relationship between earthquake experience on PTS, $\beta = 1.3$, $p = .01$. Earthquake experience and community identification collectively explained 30% of the variance in post-traumatic growth.

Discussion

Our findings indicate that social identity processes are important mediators of the relationship between traumatic experiences and post traumatic sequelae. Our data indicates that six months after a devastating earthquake and its aftershocks, levels of post-traumatic stress were very high and those that had the most experience of injury and loss were those that had the highest level of symptoms. Consistent with our hypotheses, this relationship between experience of injury and loss and PTS was mediated by collective efficacy. Community identity did not mediate the relationship between experience and PTS symptoms in the same way though it was a mediator of PTG. In short, participants that had a strong sense that their group can cope with adversity report both more PTS and PTG. Our study is an important empirical contribution to the literature on collective efficacy as it demonstrates the importance of identity resources in situations of mass trauma. And the study adds further to the growing body of research that places social identity at the heart of the stress process and

highlights the centrality of identity processes to understanding of traumatic stress outside of war-time contexts.

Given the very high levels of PTS symptoms in our sample, our findings related to PTG are worthy of note given their message of hope. First, our findings add to the growing body of evidence that suggest that post-traumatic stress and post traumatic growth are often co-present rather than sequential phenomena in traumatic circumstances. Stronger collective efficacy and community identity was associated with the emergence of post traumatic growth. Consistent with the idea that social identity can be the basis of a social cure, PTG emerged in response to earthquake trauma and was driven by beliefs in the strength of one's national and local community. Orienting as it does to PTG in response to adversity, this finding is strong corroboration in a non-Western context of social identity acting as a social cure.

It is interesting to note that national collective efficacy was a mediator of the relationship between earthquake experience and PTS whilst community identification was not. Both identity resources on the other hand appear to contribute to PTG. The scale of the earthquakes' devastation wrought in some communities we sampled cannot be overstated. During the quake and its aftershock, 8786 people were killed, more than 21,000 people injured and nearly 3.5 million people were left homeless with 802,500 houses destroyed in Nepal. In severely affected districts such as one of those we sampled, the Sangachowk Village Development Committee (VDC) of Sindhupalchowk district, where approximately ten thousand people reside according to Central Bureau of Statistics (CBS) 2011 data, more than 150 people were reported to have died, nearly 90% of the population had their homes destroyed and the community left without its school and a health care facility. In this context, the sense of belonging to (a devastated) community may not be a resource available to cope with traumatic stress. More surprisingly collective efficacy was positively related to PTS

directly and indirectly through its relationship with earthquake experience: a greater sense of efficacy was related to more PTS symptoms. Those who believed Nepali people were strong and efficacious in response to adversity may report more difficulties negotiating the earthquake because of the evident difficulty the country had in mounting a coherent response (Agrawal, 2016). Irrespective of the correctness of this interpretation, our findings point to the different value of various dimensions of identity. Each can be seen as a resource that has stronger or weaker fit to the traumatic context and by implication stronger or weaker capacity to act as a social cure. In the post-earthquake Nepal context, collective efficacy was associated with higher symptoms of PTS though community identification and collective efficacy can both be seen to promote PTG.

In this way it is not easy to conclude that social identities are always 'good for your health'. Our findings also demonstrate the very real psychological disadvantage of being a member of an under-privileged group as well as in the psychological cost of higher collective efficacy in a setting where crisis responding is compromised. This is reflected in the ethnic group gradient in prevalence of PTSD cases apparent in our study lower status caste groups (Dalit) and members of the Janajati ethnic groups report more severe earthquake experience and more PTS symptoms than high caste groups. And caste/ethnic group membership is an important covariate in our models predicting PTG and PTS. This psychological consequence of under privilege is also reflected in the very high prevalence of post-traumatic stress disorder in this community sample in Nepal, particularly when compared to incidence and prevalence of PTSD in Western populations affected by earthquakes which tends to be considerably lower (Neria, Nandi, & Galea, 2008). More than 50% of our sample reported symptoms severe enough on the post traumatic stress checklist to warrant a diagnosis of PTSD. This level of PTSD can be considered very high and can be variously attributed to the scale of the disaster, repeated experience of trauma, the everyday material disadvantage

experienced by our participants as they struggle to deal with the aftermath of the earthquakes. In this way, group memberships can be seen to be at the heart of trauma experiences even outside of war-time contexts.

Our intention in orienting to PTG is not to suggest that this distress is not problematic. One danger of orienting to PTG is that the very real material needs in poor countries in the wake of mass disasters are ignored because of a narrative of post traumatic growth. Given the very high level of PTSD cases in our sample together with the fact that prevalence was higher in lower status groups, we argue that the serious poverty and material disadvantage of affected communities is a central part of the context that determines PTS. The structural disadvantage experienced by those adversely affected by inequality is a central part of the material and cultural context that drives both PTS and communities and nations ability to respond to mass disasters. Thus our findings can be seen as a call to respond in a sustained way, that support existing collective resources, to the very clear additional needs created in poor nations by mass disasters.

Our findings therefore have important applied value. To date support for those affected by mass trauma have oriented to the importance of personal resources such as self-efficacy and social support via family networks. Sadly these resources can be devastated for many in earthquake situations, particularly in the developing world where casualty figures are high. Those tasked with supporting communities affected by mass intervention should orient therefore to collective resources that are available through community, religious and national groups. On one level the scale of the reported PTS is consistent with the prevalent Nepali view that *dukkha* (suffering, trouble, hardship) is considered to be an inevitable and constant aspect of everyday life in Nepal. However, we are not suggesting that this level of PTS symptoms is desirable or acceptable. Indeed against this background of the perceived inevitability of hardship, even where psychological services are available, people may not be

motivated to seek help because of cultural beliefs such as *dukkha*. Balancing the perceived community and cultural resources is likely to be a challenge on the ground. Emphasising positive outcomes for the group in the past is likely to support feelings of collective efficacy. On the other hand emphasising a community's loss is likely to decrease a community's resources to deal with stress.

This study has highlighted the importance of collective identity resources in suppressing the impact of earthquake experiences on post-traumatic stress. It also suggests that identity resources, such as community identity and collective efficacy can promote PTG in the wake of earthquake devastation. This potential for growth resonates with previous findings from the social identity literature which suggests that ingroup suffering is believed to lead to particular lessons and as a consequence, groups can benefit from trauma by becoming more compassionate towards suffering outgroups and particularly those with shared characteristics (Craig & Richeson, 2012; Warner & Branscombe, 2011). Whilst the study is limited by its cross-sectional design, it is strengthened by its large sample size and ecologically valid real world sampling. It is also one of the first studies to demonstrate that PTS is affected by identity resources outside of war-time contexts provide empirical support for a role for collective efficacy in response to mass trauma. And it is the first to consider that community identity and collective efficacy may be a crucial driver of PTG. This presents the exciting possibility of identity processes being a key social cure for the many people affected by trauma globally.

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	Chhetri	Brahmin	Janajati	Dalit	Others
Male	30	59	67	9	31
Female	25	49	54	10	40
Third gender	0	1	0	0	0
Totals	55	109	121	19	71
Mean no. of earthquake experiences	2.34(.89)	2.44 (.88)	2.84 (.85)	2.57 (.93)	2.84 (.85)
% PTS Cases within each group	47.3% N=26	45.0% N=49	59.5% N=72	57.8% N=11	66.2% N=47

Table 1: Composition of sample together with mean ethnic earthquake experience and PTS scores which differed significantly by ethnicity

Table 2 Correlation matrix of study variables showing bivariate correlations above the diagonal and partial correlations while controlling for gender below the diagonal.

	1	2	3	4	5	6
1. PTG	—	.175**	.357***	.196***	.533***	.124*
2. PTS	.177**	—	.197***	.547**	.094	.153**
3. Collective Efficacy	.366***	.215***	—	.181***	.320***	.008
4. Earthquake Experience	.205***	.557***	.210***	—	.193***	.104*
5. Community Identification	.549***	.102*	.317***	.204***	—	-.046
6. Age	.149**	.185***	-.001	.129*	-.062	—

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 3 Parameter estimates of the model examining the mediating role of community identification and collective efficacy in the relationship between earthquake experience and post-traumatic stress (PTS) and post-traumatic growth (PTG).

		Path Coefficients				
Outcomes		Path	B	SE	95% CL	R ²
Collective Efficacy	Earthquake Experience	<i>a</i>	.35***	.09	[.18, .52]	.05
Model 1						
PTS	Collective Efficacy	<i>b</i>	.34***	.09	[.17, .51]	.34
	Direct effect	<i>c'</i>	9.89***	.81	[8.29, 11.49]	
	Indirect effect	<i>ab</i>	.39	.21	[.50, .90]	
Model 2						
PTG	Collective Efficacy	<i>b</i>	.15***	.02	[.11, .19]	.16
	Direct effect	<i>c'</i>	.08***	.03	[.01, .15]	
	Indirect effect	<i>ab</i>	.05	.02	[.03, .08]	
Community Identification	Earthquake Experience	<i>a</i>	.28***	.26	[.14, .42]	.21
Model 3						
PTS	Community Identification	<i>b</i>	-.18	.59	[-1.34, .98]	.31
	Direct effect	<i>c'</i>	10.41***	.83	[8.78, 12.03]	
	Indirect effect	<i>ab</i>	-.02	.16	[-.35, .29]	
Model 4						
PTG	Community Identification	<i>b</i>	.27***	.07	[.13, .41]	.30
	Direct Effect	<i>c'</i>	.07*	.03	[.01, .14]	
	Indirect Effect	<i>ab</i>	.07	.02	[.04, .11]	

Regression weights *a*, *b*, *c*, and *c'* are illustrated in **Figure 1 and 2**. The 95% CI for $a \times b$ is obtained by the bias-corrected bootstrap with 1000 resamples. Earthquake experience is the independent variables (*x*), collective efficacy and community identity are the mediators (*m*), and PTG and PTS are outcome (*y*₁ and *y*₂). *R*² is the proportion of variance in *y* explained by *x* and *m*. CI [lower bound, upper bound] of 95% confidence interval.

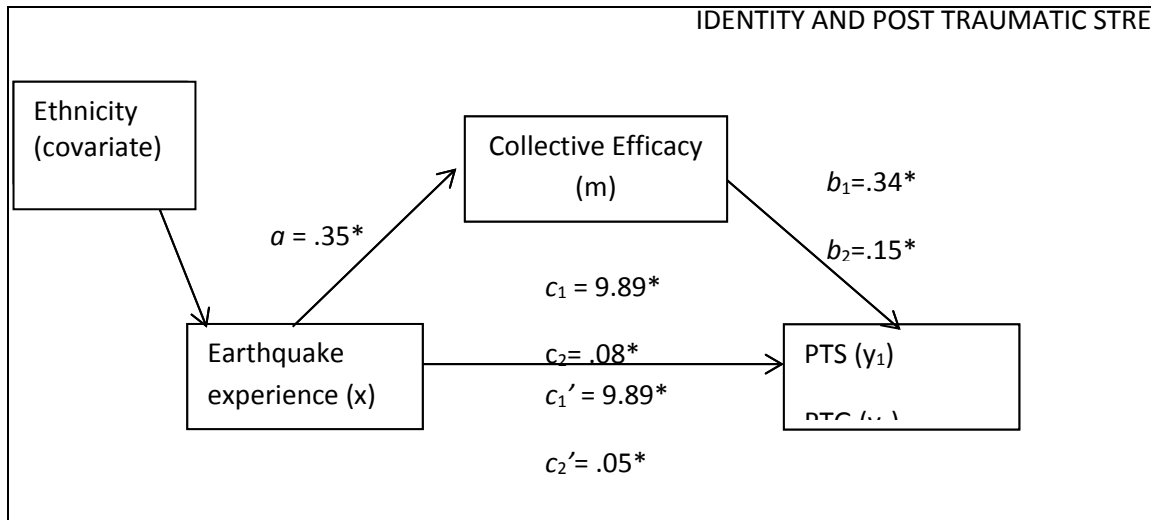


Figure 1. Mediation of collective efficacy on the relationship between Earthquake Experience and Post Traumatic Stress (subscript₁) and Post Traumatic Growth (subscript₂). * indicates significant relationship.

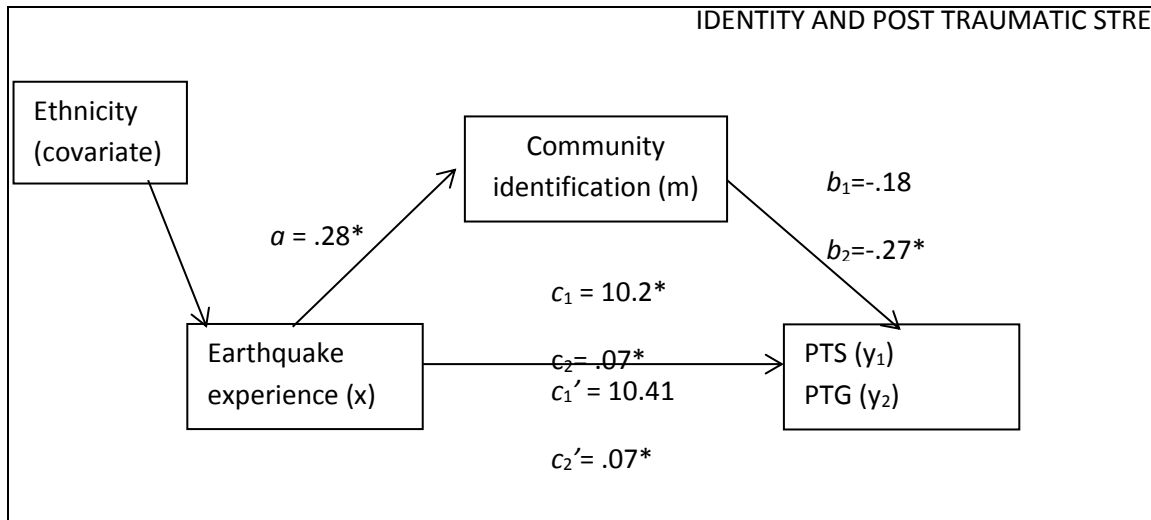


Figure 2. Mediation of community identification on the relationship between Earthquake Experience and Post Traumatic Stress (subscript₁) and Post Traumatic Growth (subscript₂).

* indicates a significant relationship.